PROJECT NUMBER: 1758
PROJECT TITLE: Tobacco Cell Wall Research
PROJECT LEADER: G. H. Bokelman
PERIOD COVERED: October, 1987

I. BLEND COMPOSITION ANALYSIS (G. Bokelman, J. Stimler and General Analytical)

A. Objectives: Predict the blend compositions of Camel (non-filter, 70 mm), Camel Filter (85 mm), Capri Menthol, Capri Regular (separate samples obtained in February and April), Caprice and Slim Line cigarettes.

B. Caveats: Our standard method of estimating blend compositions based upon chemical predictors should give accurate results when the actual tobacco components to be used are incorporated into the database, a condition which for practical purposes only can be met for products manufactured by Philip Morris. Inaccurate results may be obtained if this method is applied to unknown blends or blends whose components differ markedly in chemistry from those used in the database. The database for this study consisted of typical commercial tobacco components used by Philip Morris for domestic cigarette production in the first quarter of 1987.

C. Results:

The predicted blend compositions for the various cigarette brands are reported below. Values are expressed as percentage of total, rounded to the nearest percent.

Component	Camel	Camel Filter	Capri Menthol	Capri Reg. (2/87)	Capri Reg. (4/87)	Caprice	Slim Line
Bright Lamina	48	41	57	47	42	43	64
Burley Lamina	25	17	16	28	26	25	16
Oriental Leaf	8	18	17	20	22	20	9
Stem	19	24	10	6	9	12	11

Previously, based solely on β-methylvaleric acid determinations, it was estimated that Camel contains 9.3% Oriental leaf and Camel Filter contains 19.0% Oriental leaf.

D. Plans: In collaboration with Bill Ryan and Betty Handy, chlorogenic acid and rutin will be evaluated as potential predictors for bright lamina content.

E. Reference:

Bokelman, G. H. and J. O. Stimler, memo to Dr. J. L. Charles, "Estimations of Blend Composition of Capri, Caprice and Slim Line," October 8, 1987.

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Source: https://www.industrydocuments.ucsf.edu/docs/mngm0000

II. MOLECULAR WEIGHT DISTRIBUTION OF DEGRADED PECTIN SAMPLES (S. Baldwin)

A. **Objective**: Evaluate the molecular weight distributions for a number of degraded pectin samples by gel permeation chromatography in order to compare samples prepared by different processes and to examine the consistency of individual processes.

B. **Results**:

Medium pressure gel permeation chromatography was performed using 0.1 M phosphate buffer at a pH of 6. Dextran standards were used to calibrate the columns for weight average molecular weight. An excellent linear calibration was obtained; however, it should be noted that the use of dextran standards for the estimation of pectin molecular weight will be biased to yield high values because pectin and dextran do not have the same shape in solution.

In-house thermally degraded pectin samples from the continuous process were compared to batch degraded samples. In general, the continuously degraded materials appear to have small amounts of higher molecular weight components than the batch degraded samples. None of the continuously degraded samples was a perfect match for SD-14, the currently preferred (in-house) binder. SD-14 was prepared in the batch process by holding a 15% solution of pectin at 145° C for 15 minutes.

Three experimental samples obtained from Hercules were evaluated. These samples were all very different from one another, indicating that neither the process conditions nor the product are yet well defined. Two of the samples had lower molecular weights than our in-house degraded samples.

A comparison also was made between Grindsted samples TSP-092 and TSP-095, which represent different batches of thermally degraded lime pectin. The profiles for these two samples were virtually identical, indicating that Grindsted has very good control of their degradation process.

Finally, the reproducibility of the Philip Morris batch process was examined. SD-33 was made under the same process conditions as SD-14, that is a 15% pectin solution was held at 145°C for 15 minutes. Comparison of the respective chromatograms showed that the major component elutes in fraction 22 for both samples. The overall elution profiles also are very similar, indicating that the process conditions have been well controlled.

C. **Plans**: A limited number of other degraded pectin samples will be analyzed, as time permits.

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